at large (especially including U.S. broadcasters) to rally behind this standard and begin the work of helping drive down the costs.

Sony urges the Commission and broadcasters to look objectively at the very considerable merits of the U.S. digital SMPTE 260M standard in an effort to expedite the provision of ATV service to the American public.

6. The critical issue of an exclusive U.S. broadcast HDTV origination standard.

Woven into the long dispute concerning HDTV production standards is the contention of some that one of the other "broadcast-based" production proposals offers potentially more cost-effective possibilities. We believe that this contention is without merit.

By way of illustration, we would like to discuss the one alternative production standard which is technically the furthest removed from 1125/60 SMPTE 240/260M - the 787.5/59/94 progressive scan studio origination proposal currently under study within SMPTE. We wish to make it very clear that our comments are exclusively directed to some financial shortcomings we find in an HDTV **production standard** based on this format. As an ATV <u>transmission format</u> for the very constricted 6 MHz terrestrial channel, there is ample evidence that the 787.5 progressive proposal is quite excellent and a very worthy contender in the current competitive activities within FCC ACATS.

HDTV cameras utilizing CCD technology finally are available. This 1920 x 1035 pixel CCD (for 1125/60) is the product of many years of R&D and a very substantial investment. It is stunningly successful in its performance and received wide acclaim at NAB '92. Clearly, a CCD imager could be developed with 1280 horizontal pixels and 720 rows and the high sampling frequency required to sustain the real-time 787.5 progressive scan system -- using this same technology base. However, development costs of any HDTV CCD are truly enormous. We know this at first hand, having finally perfected (after many years) the CCD imager for the 1125/60 SMPTE 260M standard. Today we are amortizing these costs by selling precisely the same HDTV camera in the Japanese, North American, and yes, even the European, markets. We estimate a redesign of this CCD (that is, utilizing all of the already refined core technologies, but redesigning the lithography etc. for the specific pixel structure of the 787.5 progressive system) would involve a further $10-15 Million R&D investment that would have to be amortized, inevitably driving costs up rather than down.

However, the primary difficulty we foresee is the very restricted use of such a new CCD. Because of its inherent limitations, it would be used exclusively by the U.S. broadcaster (we are, of course, assuming for this discussion that the U.S. has chosen 787.5 progressive as an HDTV production standard to support this ATV standard if it has won the FCC selection in 1993). This new camera would never be used by other high-end

program producers, Hollywood motion picture community, or business and industrial entities who had the alternative 1125/60 CCD camera available to them. The performance difference is too great. The SMPTE 260M based CCD has 1,987,200 pixels in contrast with the 921,600 pixels of the 787.5 progressive camera - a dramatic shortfall of more than 1 Million pixels). This translates into a significant reduction in spatial resolution of the HDTV image capture.

This disparity in spatial resolution would constitute a technical barrier to the use of the 787.5 progressive system in HDTV-film media conversion. Today, 1125/60 is being transferred to film on a routine commercial basis in the U.S., Europe and in Japan. The results are being widely acclaimed by motion picture producers. Superb HDTV-to-film and film-to-HDTV transfers are being made and international program producers are already putting this new breakthrough media-synergy to highly creative effect. The performance standard is now firmly established and nowhere does this impact greater than on the enormous U.S. program production community. The 787.5 progressive system, while well tailored to the unique technical constraints of 6 MHz over the air broadcasting, does not even meet the requirements of high-end program production.

The limitations of the 787.5 progressive system become even further apparent when considering the need for international program exchange and international co-production. 787.5

progressive will not allow high quality standards conversion to the 1250/50 European HDTV system -- whereas 1125/60 will. Even downconversion to 625/50 will be inferior to what can be achieved with 1125/60.

Sony thus views 787.5 progressive -- if it became a U.S. broadcasters **production standard** -- as being an extremely one-market-only standard with no hope at all of achieving the real economies of scale required to lower costs. Moreover, the price of such equipment necessarily would reflect the substantial new R&D investment that would be required on the part of all international camera manufacturers and which would not be necessary for the 1125/60 equipment that already has been developed.

On this basis, and assuming Sony had a reasonable hypothetical share of the U.S. 787.5 studio broadcast market, we estimate the cost of these cameras to be **20 to 30%** more expensive than their 1125/60 counterpart. Such an additional cost would, in our view, be extremely counterproductive (particularly bearing in mind that current 1125/60 equipment is still expensive) and would represent an intolerable fiscal burden on U.S. broadcasters.

We also have analyzed the cost situation for HDTV video tape recorders and HDTV studio monitors - two key products which are used in quantity in broadcast facilities. Again, if the

787.5 progressive system were to be selected as the U.S. HDTV production system, we estimate that an HDTV digital VTR would cost about **10%** more than a comparable unit based on SMPTE 240/260M - provided this was a redesign of our current digital VTR based on a Common Data Rate approach (that is, the same total data rate as digital SMPTE 260M). Although not as large as the cost penalty for cameras, this cost differential would result from the relatively exclusive use of this 787.5 progressive VTR within the U.S. broadcast industry and the significantly lower volume than would be experienced with the 1125/60 VTR. Finally, even a 787.5 progressive-HDTV studio monitor, although priced substantially lower than an HDTV camera or VTR, nevertheless would represent a radical redesign (primarily the 40% increase in horizontal frequency and the very short retrace time over that of the 1125-based monitor) and similarly low production volume. As a result, we believe that such a studio monitor would be priced about 30% higher than the equivalent 1125/60 SMPTE 240M monitor.

Finally, we should comment on the **1050/59.94 Interlace** scan proposed HDTV production standard. This is actually so close to the 1125/60 system that in terms of an absolute cost comparison that it really becomes a non-issue. The 1050-based system faces all of the cost hurdles of 1125/60. However, it is far more important to consider once again the issue of volume. The small increase in vertical resolution of 1125 over 1050 by itself does not constitute a significant advantage, but the few additional advantages of the 1125/60 format more surely establish

it as the standard most likely to enjoy a much wider base of support across other industries. These advantages include:

- **1125 downconverts to 525 and 625 with equal convenience.** 1050 downconverts to 525 with no more ease than 1125 (but a little less interpolation overhead) but it is decidedly cumbersome in its downconversion to 625. This is an important point for international program distribution;

- 1125 has 1035 active picture lines which nicely encompass the popular 1024 computer format. 1050 on the other hand, having only 960 active lines falls short; and

- 1125 has more vertical "overhead" which ensures the highest performance transfer to 35mm film.

1125/60 SMPTE 260M based CCD cameras are available today -- and manufacturers like ourselves are already selling them. SMPTE 260M -- still the only HDTV fully documented and formalized production standard -- is being sold, as was mentioned earlier, all over the world. Thus, the engine of production already is underway. This standard, agreed to in the U.S, and also in Japan, surprisingly is also being accepted on a <u>de facto</u> basis in many countries in Europe. This is simply because it is

recognized by many as being a very well documented standard, the supporting HDTV equipment is readily available, and it is of outstanding performance. This important dynamic should not be ignored. **We stress again, that such worldwide, inter-industry economies of scale are crucial to lowering HDTV equipment costs for all.**

It is Sony's earnest hope that this frank exposition will galvanize attention to a situation we see as being important to the overall U.S. drive to ATV. There is no question that HDTV studio equipment now carries a high price. But with the R&D completed, the goal now is to increase the volume of production in order to lower costs and the resulting price. This can be achieved only by uniting behind the already existing superb U.S. 1125/60 HDTV production standard.

B. The ATV Receiver

Although we believe that selection of a single production standard, and the consequent reduction in the cost of HDTV origination equipment, is critically important to the successful introduction of ATV service, consumer acceptance of and investment in this new technology ultimately will set the pace for conversion from existing NTSC service. Like all television receiver manufacturers, we are ceaselessly revising our predictions of the likely marketplace scenario relating to the development of ATV services in the U.S. We see -- and

applaud -- the strong leadership of the Commission as it maps out the critical guidelines that seek to ensure both an expeditious move to ATV by over-the-air broadcasting while also searching for an orderly future phaseout of NTSC transmission. Moreover, Sony has actively participated (and continues to do so) in the now almost four year study of ATV market penetration and implementation scenarios, and their associated cost assessments, within the FCC Advisory Committee on Advanced Television Services. However, because of the wide range of factors that may impact upon consumer behavior, it is not yet possible to define with precision the likely scenario for transition to full ATV service.

Nevertheless, there are certain facts of which we are confident. There is no doubt that ATV receivers will become available within as short a period of time as is technically possible (following the final FCC decision selecting the ATV transmission standard). The clear definition of a single standard by the FCC, the commitment of the U.S. broadcasters, and the sheer size of the North American marketplace (we assume Canada and Mexico will also commit to this same standard) -- all will ensure a vigorous participation by all major global television receiver manufacturers. Certainly, our own San Diego and our new Pittsburgh television manufacturing plants, have factored ATV receivers into their long-term planning. What is questionable, however, is the introductory pricing of these receivers, the rate at which receiver prices will drop over time,

and the rate at which penetration of the home market will grow.

1. ATV Receiver Price

The cost of the ATV receiver is primarily dependent upon:

- Display system and
- ATV demodulator-decoder system.

Without a close analysis of the various ATV demodulator-decoder systems, we cannot yet comment on these costs other than to express our confidence that digital LSI will help lower these. We can, however, comment on the display.

Sony has repeatedly emphasized that ATV is not merely "more resolution in wide screens" (that approximate the size of today's high end NTSC receivers). ATV must dramatically transform the living room viewing experience if it is to have any hope of repeating the success story of the transition from black and white to color television. This can only be accomplished by distinctly larger television screens that can properly apply the additional electronic information inherent in the system to a portrayal that is awe inspiring to the consumer. We know of no direct view display technology (which can be cost-effectively mass produced) that can yet come even close to fulfilling this vital criteria. Projection systems, however, can readily achieve the requisite screen size and brightness.

We believe such projection systems will spearhead the penetration of ATV. They will initially be expensive -- and will consequently appeal largely to the affluent in the early days. We see such systems as critical to the drive to the important one percent market penetration point. We cannot, however, offer even a tentative pricing at this time. We are still doing our research -- attempting to reconcile the (now only recently divulged) technical information on the various ATV systems on the total video data, pixel structures, etc. that are transmitted to the home with the degree of associated compromise that can be incorporated into projection tubes and optics.

The direct view display technology of CRT is today highly refined and experience is already being gained in manufacturing 16:9 HDTV consumer versions of this technology. Screen sizes are marginal for effective ATV portrayal. However, they do offer the highest potential for ultimately achieving displays affordable to the mass audience. One item of "good news" in this area is that 16:9 CRT is a global movement driven by the ATV agendas of Europe, Japan and North America. Happily the international consensus on 16:9 is allowing an important economy of scale in this critical area (despite the world fracturing into regional ATV standards). So, while we believe the larger projection systems to be critical to the initial all-important market penetration -- and continuing as the high-end full-ATV home system -- we also recognize that direct view CRT

with smaller screens will ultimately constitute the more cost-effective mass market.

Finally, while all of our comments have been based on those display technologies known to us, like other manufacturers, we can only guess as to when new display technologies will burst onto the scene. Certainly there is a rapidly escalating effort going into new display technologies -- all over the world. A breakthrough might happen at any time. Recent reports are even encouraging. However, we cannot make any specific comments to the Commission on what might unfold in this area -- other than an expression of our high confidence that amazing accomplishments are to be anticipated within the 15 year conversion period suggested by the Commission.

2. Other Factors

In addition to price, Sony believes that the initial growth of ATV will be dependent upon the following factors, each of which also will affect the pricing of ATV receivers by virtue of their impact upon consumer acceptance of this new technology:

- Perception of the consumer seeing the ATV presentation compared to contemporary NTSC in the dealer showroom;

- Availability of ATV programming; and

- Diversity of ATV delivery media

Each of these is discussed below.

a. Consumer Perception of ATV

We believe that the dynamics of the U.S. television marketplace will be complex and fluid over the coming decade. As discussed further below, an embryonic digital ATV service will vie for consumer attention amidst a burgeoning (and highly attractive to some) new multichannel, near video-on-demand, digital NTSC services. Terrestrial broadcasting, cable and DBS will jostle for marketing position of their digital ATV and new digital NTSC services. U.S. consumers will be assailed by a bewildering plethora of messages, and the ensuing confusion could well forestall the decisive growth of all.

Paramount to the success of ATV, is a distinctly clear separation of the viewing experiences of ATV from those of NTSC. A best, the few ATV channels in a given marketplace will never compete -- in terms of program plentitude and choice -- with multichannel NTSC services offering a vast array of program choices. ATV can only attract viewers by offering a visual and aural experience that is altogether on a different plane from NTSC television. This fact has profound implications for:

- Independent program producers;

- Broadcasters - and their local origination capabilities;

- Concept of simulcast; and

- Choice of an NTSC termination date

Critical to broadcasters' ability to provide that uniquely different experience is the need to accumulate actual "hands on" experience in HDTV programming and production techniques. At the present time, there is an almost total lack of any experimental HDTV production within the huge U.S. broadcast infrastructure. This is in sharp contrast to a wide and diverse HDTV programming exploration in Europe. Despite all forms of complexities regarding an ultimate European HDTV service, there remains a widespread confidence that it is inevitable and the learning process has consequently been eagerly embraced. Not so in the U.S.

Extensive experimental HDTV production is being conducted by European broadcasters and independent program producers using both 1125/60 and 1250/50 production equipment -- whichever is available at any given time. It was early recognized that HDTV broadcast origination would call for radically new production techniques affecting all disciplines from the cameraperson to post-production editor, and that an important experimental phase needed to proceed subsequent larger

HDTV equipment acquisitions. In particular, multiple camera shooting events -- especially of sporting events -- are being profoundly impacted by considerations of:

- Much wider angle shooting;
- Different placement of cameras (from traditional 625 disposition);
- Number of cameras (first two points affect this choice);
- Duration of individual camera shots and number of cuts between them; and
- Need to subsequently downconvert to narrower angle 625 view.

In addition to altering the entire "Look" of a broadcast pickup -- there are sizeable cost implications woven into all of the above (for example, if fewer cameras are required for a given broadcast pickup because of wider angle shooting this becomes a favorable cost issue).

As U.S. broadcasters ponder their entry into ATV, they are, as a whole, hampered by the lack of this new learning experience. This hinders good planning. RAI (the large Italian

broadcaster) recently reported on three years of experience gained in learning how to optimally cover soccer games using HDTV and emphasized that the learning curve was much longer than expected. Given that U.S. broadcast NTSC shooting techniques are quite different today from how Europeans traditionally originate, then it seems likely that we have some unique new HDTV earning experiences still ahead of us.

It is thus very important that broadcasters begin to acquire available HDTV equipment and start a systematic program of shooting experiments to grow the requisite expertise that will affect so much of their future planning and purchases for the ATV era. This is also very important to creating a backlog of programming to support the initial ATV services.

b. ATV Programming

We have been well taught by the history of television that there is a direct correlation between market penetration and the availability of programming. Color television and VCR provide classic examples. It is to be anticipated that this relationship will be especially true for ATV where the consumer investment will be higher than before (certainly in the early years). It is quite unknown how the U.S. consumer will react to a radically enhanced audio-visual home experience compared to new equally radically enhanced NTSC services such as video on demand.

It is our conviction that only an abundance of ATV programming -- **with program material that properly exploits the full capability of the large ATV picture** -- will stimulate a widespread consumer embracement of ATV. ATV, especially in the first decade, must truly embody a "value added" experience. And while a "blockbuster" movie experience -- in a home cinema-like environment of large wide screen and multichannel digital audio is certainly value added (in comparison to today's paltry television movie portrayal), it will not be enough.

Value added programming must speak to quality, quantity, and an optimum mix. Three program types enjoy wide appeal in the U.S: sports, movies, and special events. They also happen to lend themselves wonderfully to a dramatic enhancement with ATV wide angle imagery.

Of all three, sports programming stands out, in our view, as the one where all of the powerful attributes of ATV could be applied to bring to the living room an unparalleled viewing experience. The sensation of reality provided by wide angle shooting and portrayal on large widescreens we believe to have a potential impact far greater than was the advent of color over black and white television. ATV breaks through that most fundamental flaw of current television -- the small, narrow window-like view of the world. It is our conviction that sports coverage in ATV is central to the drive for wide consumer acceptance. And, most important of all -- sports coverage needs

the broadcaster. Thus, the broadcaster is crucial to the successful take-off of ATV.

The movie experience also can be defined. The tremendous difference in emotional impact between the cinema portrayal of a given movie and its lesser television presentation is well known. The full ATV experience can dramatically narrow this gap. Thus, Hollywood is critical to the successful take-off of ATV.

Special events, such as Olympic games, major golf tournaments, boxing bouts, rock concerts, horse-races (the list is endless), offer immense opportunities to allow ATV origination to create a new sense of presence that is quite impossible with conventional NTSC television. Again the broadcaster is central to many of these productions, in addition to a variety of independent U.S. producers.

c. Diversity of ATV Delivery Media

The majority of U.S. consumers today have grown very accustomed to a plethora of NTSC programming via a mix of delivery media:

- Terrestrial broadcasting -- average 10 channels
- Cable Systems -- average 30 channels

- VCR -- the rental store

Any new television service is confronted with the now well honed purchasing discretion of the world's most sophisticated consumer.

That same consumer will look askance at any sizeable investment in an ATV receiver that only has one delivery media available to supply programming. It is critical, therefore, in our view, that the cable industry (and ideally, a DBS service) become involved in ATV during those same first critical five years that the terrestrial broadcasters are launching their service. It is critical, too, that it be possible to introduce a VCR that is sensibly interoperable with the U.S. ATV receiver -- and that it enters the marketplace in approximately the same time frame as the initiation of significant ATV transmission services. In the early days of limited ATV programming, time shifting will be critically important to extending consumer access to this programming. This also, of course, implies a solution to copyright protection issues not yet discussed in the context of ATV programming. There is a "critical mass" of perceivable (to the consumer) ATV delivery mechanisms that must be combined with an equally "critical mass" of ATV programming to decisively convince the U.S. consumer to commit to an ATV investment which they will surely view as long term. An allegedly "enhanced" future television service can never take anything away from the U.S. consumer to which they have by now grown very accustomed.

C. The Home ATV-NTSC Downconverter

In addition to HDTV origination equipment and ATV receivers, the Commission expressed a keen interest in the topic of the ATV to NTSC downconverter, perceiving it to be critical to the ultimate schedule for 100% simulcasting and to the termination of NTSC over-the-air transmission. We will first attempt a perspective based upon pricing.

Total annual television sales in the U.S. today are in excess of 20 million sets. The average retail price of color TV is about $400. There is an installed base greater than 150 million units. The current average retail price of a VCR is $260. Total annual sales are about 10 million and there is an installed base of approximately 78 million units.

In order to utilize future ATV programming, both devices will require downconverters. If we make the initial assumption that the downconverter is designed for the utmost in simplicity -- that is, it does a direct line rate conversion and a "brute force" aspect ratio conversion (meaning a 4:3 center crop or an alternative letter-box) then we estimate the cost of such a consumer downconverter to be in the same range as the digital decoder in the ATV receiver. Possibly this will drop to one third that price within the first 5 years as volume and competition expand and as increasing commitment to very large scale IC chips is made.

We thus see such downconverters being considerably more expensive than the average NTSC receiver and VCR. We anticipate downconverters to be non-friendly to the consumer. They offer the same potential for consumer interface difficulties as the cable box (even when the latter are provided at no cost to the consumer there are well known problems). U.S. consumers have historically shown no affection for "adaptor boxes." It is also difficult to believe that consumers would be willing to pay so much for an add-on adaptor that robs them of their current ability to use their remote-control and pix-in-pix functions while presenting them with a letter-box or cropped NTSC picture. It's even more inconceivable that consumers will buy two of these boxes to also facilitate separate VCR recording of ATV programming.

So a larger question thus looms as to the feasibility of ultimately including downconverters within future NTSC sets or even possibly a downconverter within the ATV set with an external feed to NTSC for "neighboring" NTSC receivers. The first would have to be seen as a gigantic perturbation to a presently finely honed cost-effectiveness in NTSC receiver design and, in our view, is only conceivable in the really high-end expensive models where the cost impact could at least be explored for feasibility. But, how many high-end NTSC receivers will be sold in an era of ATV start-up is a question that preoccupies us. We have no clear answer to this at the present time. The alternative incorporation of the digital downconverter within the ATV

receiver has a certain technical elegance associated with it but poses a question relating to consumer interface logistics.

The trickier technical issue which currently haunts us as we examine the consumer downconverter is the vexing creative dilemma associated with the 16:9 to 4:3 aspect ratio conversion. Letter-box NTSC is the simplest solution -- but we have little indication that U.S. consumers will find this attractive. The alternative full height "center crop" conversion introduces the problem of loss of important picture content. Today such decisions are made by the program creators when they dynamically pan-scan widescreen film for 4:3 telecine conversion. Proposals have surfaced about the transmission of digital control signals -- tailored to a given program (developed during the post-production process) -- that can operate a pan-scan function within the home downconverter. This entails a standardization activity (not yet underway) and, of course, the additional cost of the new intelligence circuits in the home downconverter.

One can presume a scenario where cable systems continue NTSC programming and the cable system operator will downconvert (with a professional sophisticated downconverter) any ATV channel of interest without the need for the consumer to make any hardware purchases. However, the resulting loss of direct viewership is not in the best interest of the broadcaster.

Of course, it can be argued that the presentation of a less than satisfactory NTSC downconversion from the ATV original will in itself be a continuing and healthy marketing spur to eventually lure the consumer to invest in true ATV.

However, in summary, there appears to us to be very little on which to base a high confidence that the home ATV downconverter will be successful during the proposed 15 year conversion period. The high percentage of the U.S. homes that today receive such a broad diversity of NTSC program choices via cable will be little motivated to buy an expensive "adaptor-box" that brings in, at most, a few more channels of possibly inferior NTSC presentation.

III. SIMULCASTING

A. Programming Aspect of Simulcast

The complex topic of simulcasting only grows more as the debate widens. A simulcast scenario seeks a balance between: on one hand, protecting the gigantic investment in the installed based of NTSC equipment, while, on the other hand, it must unfetter the full visual-aural potential of ATV if this new service is to have any hope of achieving a brisk market penetration rate. Further Notice, ¶ 58-65. Which is the larger task?

It is the view of Sony Corporation that few constraints must be placed on the embryonic ATV service. It will have much to contend with -- particularly if, as we fully anticipate, multichannel (video on demand) NTSC services emerge via alternative media and offer an enormously attractive programming option to the same consumer who might also be considering ATV. If the Commission judges it to be an imperative that the transition be expedited from the existing NTSC service to ultimately an ATV-only service (that is, ATV is not a separate, additional, broadcasting service), then some presently nebulous issues surrounding simulcasting need to be exposed and carefully reviewed.

1. The ATV versus NTSC Visual Experience

As stated above, we believe that U.S. broadcasters still have much to learn about the awesome imaging capabilities of HDTV in contrast with the much more limited NTSC. ATV is not just more resolution in a screen size approximately that of today's 30-35 inch NTSC receivers -- with only a widening of the screen as the most visible attribute of the "new" picture. ATV should instead capitalize on the enormous new imaging capability built-into the front end of the system -- namely, the camera. ATV should be:

- Large Screen (50 inch diagonal and greater);

- Widescreen (16:9);

- Wider Angle of View imagery (30 Versus 10° average); and

- Multichannel digital sound.

It is this combination that will generate totally new pictures -- which Sony firmly believes will be the dramatic feature to attract large numbers of consumers to ATV.

When they can see a vivid, wide angle, presentation of many sporting events in contrast with the "zoomed-in" close-up techniques so synonymous with NTSC pickup; when they see wide angle shots of a full orchestra, opera stage, rock concert, instead of the constant rapid switching around multiple "close-up" NTSC views; when documentaries, nature programs, dramas all are portrayed in large screen and wide angle -- then the far greater **sensation of reality** and emotional impact will ultimately captivate the viewer. When dramatically larger displays sizes are combined with the equally dramatic new picture content -- and accompanied with superb multi-channel sound -- then Sony believes ATV will become irresistible to the consumer.

2. The Dilemma of the Downconverted Simulcast NTSC

But, latent within this important scenario, lurks a dilemma. What is portrayed to the NTSC receiver-only viewer within the presently defined simulcast proposal? If traditional downconversion techniques are used, then the wide angle ATV picture must "shrink" drastically -- in two ways:

- The vertical picture edges will be "cropped" by virtue of the 16:9 Widescreen to traditional 4:3 aspect ratio of NTSC and

- The picture content that is left, will be unsatisfactory in that the smaller NTSC picture size but larger picture content of the original wide angle shot -- all funnelled through the much narrower "pixel" display of NTSC -- will be a quite unsatisfactory picture in many respects.

The simple solution, of course, is to "frame" the ATV original camera picture with a narrower angle more commensurate with that of NTSC. However, as stated, Sony believes this to completely defeat the whole point of an enhanced ATV imagery.

The technical solution is perfectly feasible. The professional downconverter used by the broadcaster can electronically "zoom" the output NTSC image in a manner that presents a more traditional NTSC picture. But it will be quite different to the ATV original picture content. Of course, there